

REMARKS

Claims 1-11 are pending in the current Application. Claims 2, 3, 7, 10, and 11 were objected to because of informalities. Claims 1-10 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,017,200 issued to Childs et al (Childs). Claim 11 was rejected under 35 U.S.C. §103(a) as being unpatentable over Childs.

Response to Objections

Claims 2 and 3 have been amended to clarify that the phrases "same piston" and "different piston" refer to a first piston and a second piston. These claims were amended for purposes of clarity and not for purposes of overcoming prior art.

Claims 7, 10, and 11 were amended to correct pendency. These claims now correctly depend from independent claim 6. This amendment was made for purposes of clarity and not for purposes of overcoming prior art.

All outstanding objections and informalities have been corrected and Applicant respectfully submits that these claims are now in condition for allowance.

Response to Request for Drawings

This application was filed as a U.S. National filing from PCT application No. WO 01/05490. As such, drawings for this application should be obtained from the PCT file. At the Examiner's request, however, Applicant is providing a copy of the 4 sheets of drawings filed in the PCT application. No changes have been made to these drawings.

Acknowledgment of Interview Summary

Applicant hereby acknowledges and confirms the content of the interview summary of the telephonic interview conducted with the Examiner on August 26, 2003.

Response to 35 U.S.C. §102 Rejection

Anticipation under 35 U.S.C. §102 “requires that each and every element of the claimed invention be disclosed in the prior reference.” *Akzo v. U.S. Int’l Trade Comm’n*, 1 U.S.P.Q.2d 1241 (Fed. Cir. 1986). Childs does not disclose each and every element of the present method and device for desalting water including a pressure chamber hydraulically connected so that during operation a continuous pressure can be exerted on the piston.

Independent claim 6 is directed toward a reverse osmosis device for the continuous desalting of water, including, a membrane module for separating the water, a pressure-compensating device to continuously introduce the salt water at an increased pressure level into the membrane module, a feed pump to introduce salt water at a pressure level into the pressure-compensating device, and pistons. The pistons further include an intake chamber, a discharge chamber and a pressure chamber. The pressure chamber of the piston is hydraulically connected to the pressure chamber of other pistons. The piston pressure chamber assists the pressure that is exerted on the piston by the concentrated salt water that is introduced into the discharge chamber. Independent claim 1 is directed toward a method for desalting water.

In accordance with the specification, in the present invention the pressure chambers 23, 33, 43 together with the connection 7 are a closed system in which a certain pressure p_3 is provided. By use of this pressure in the pressure chamber, an opposing force f_G exists (see Fig. 2, pressure chamber 33) which is nearly as large as or slightly smaller than the force F acting on the piston 34 due to the pressure p_1 at which the salt water 10 flows into the intake chamber 31. Thus, moving the piston 34 up. Simultaneously, the piston 24 moves down so that salt water is pumped from the intake chamber 21 to the membrane module 3. Thus, the pressure p_3 supports pressure p_2 wherein salt water flowing out of the membrane module flows into the discharge chamber (in the situation shown in Fig. 2, into the discharge chamber 22), and thus leads to a higher efficiency of the whole system by effectively using the pressure p_2 under which the concentrated salt water is flowing out of the membrane module. There are several advantages of the present invention, including, that the pump 1 used for pumping the salt water into the system can be smaller, will work at a lower pressure and is thus less expensive. All of these advantages are not available in Childs.

Childs does not teach or suggest pressure chambers hydraulically connected to each other such that, during operation, a continuous pressure can be exerted on a part of the piston to assist the pressure being exerted by the concentrated salt water. Childs discloses two different embodiments to which the Examiner refers. In the first embodiment shown in Figure 3, the device includes two cylinders 86, 94. Both cylinders have only two chambers. The first chamber is referred to as a first working volume (90 and 98 respectively), the second chamber is referred to as the second working volume (92 and 100 respectively). No pressure chambers (numbered 23, 33, and 43 in the present invention) are taught, suggested or illustrated in Childs. Further, a hydraulic pump 82 is provided by Childs. The hydraulic pump also includes a piston device 130 whose piston 128 is connected by another rod 84 to the piston 96. This hydraulic pump provides the primary force for moving the two pistons 88, 96 forward and backward (see column 10, lines 1-33). The hydraulic pump 82, and thus the movement of the pistons 88, 96, and the valves are controlled by a control unit 134.

The second embodiment, shown in Figure 7, comprises three cylinders WC1, WC2, WC3 that are similar to the cylinders 86, 94 shown in Figure 3. For each cylinder, a separate hydraulic pump HP1A, HP2A, HP3A with each having a hydraulic cylinder is provided. To each of these, the pistons of the cylinders are connected by a rod 84. Effectively, there are three of the devices shown in Figure 3, which are connected in parallel. Power units 122' are provided for control of hydraulic fluid pumped through lines 124' and/or 126' for driving the hydraulic cylinders 130'. The power unit 122' is driven by a power takeoff shaft 121' which is powered by a motor 120' (see column 16, lines 33 to 40).

Childs therefore does not teach or suggest a pressure chamber and, particularly as claimed in the present invention, does not teach or suggest a pressure chamber in the rear of the pistons of the piston devices. Further, there is no hydraulic connection between any pressure chambers. Neither can the hydraulic pump 82 or the hydraulic cylinders HC be interpreted as a hydraulic connection connecting any pressure chambers. The hydraulic pumps 82/HP in connection with the hydraulic cylinders 130, 130' are only for driving the pistons in the piston devices to which they are connected by the rods 84, 84' up and down, and the shafts only connect the power units 122' in order to use a common motor 120' for driving the power units

122'. Accordingly, because claim 1 and claim 6 contain at least one element that is not disclosed by Childs, independent claims 1 and 6 are *prima facie* not anticipated under 35 U.S.C. § 102(e) by Childs. Therefore, independent claims 1 and 6 and their dependent claims are patentable over Childs and are in condition for allowance.

Childs also does not teach or suggest a pressure chamber. Childs does not provide any suggestion of modifying the desalting device to provide a pressure chamber in the rear of the pistons of the piston devices. Any such modification would only be apparent after understanding the present invention and applying impermissible hindsight analysis. Therefore, independent claims 1 and 6 and the dependent claims thereof are patentable over Childs under 35 U.S.C. § 103.

Response to 35 U.S.C. § 103 Rejection

With regard to the rejection of claim 11 under 35 U.S.C. § 103 over Childs, for the reasons noted above, Childs does not provide any suggestion of modifying the desalting device to provide a pressure chamber in the rear of the pistons of the piston devices. An analysis under § 103 requires that the Examiner explain why, after assessing the level of those skilled in the art, the skilled artisan would have found the claimed subject matter, as a whole, to have been obvious. To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references, and there must be a reasonable expectation of success. MPEP § 706.02(j). The suggestion or motivation to make the claimed combination and a reasonable expectation of success must both be found in the prior art. *Id.* The Examiner cannot rely on hindsight as the basis for combining two references. If the references do not expressly or impliedly suggest the combination, "the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." *Id.* (citing *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985)).

The Examiner has only provided the Childs reference in making his § 103 rejection. As discussed above, there is no motivation in the Childs reference to teach the

pressure chamber of the present invention. The Examiner has indicated that Childs does not specifically teach that $\frac{1}{4}$ of the piston area has pressure from a pressure chamber and $\frac{3}{4}$ of the piston area has pressure from a discharge chamber. The Examiner, however, fails to put forth examples of knowledge generally available to one of ordinary skill in the art explaining how one would come to understand these values or how the values could be obtained from the calculations presented by Childs. The Childs reference, consequently, does not suggest the pressure chamber of the desalting device of the instant invention. Therefore, claim 11 is patentable over Childs under 35 U.S.C. 103 (a)

Conclusion

The Commissioner is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

In view of the above amendments and remarks, Applicants respectfully submit that all of the pending claims are allowable. Applicants, therefore, respectfully request that the Examiner reconsider this Application and timely allow all pending claims. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC



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SDB:mt

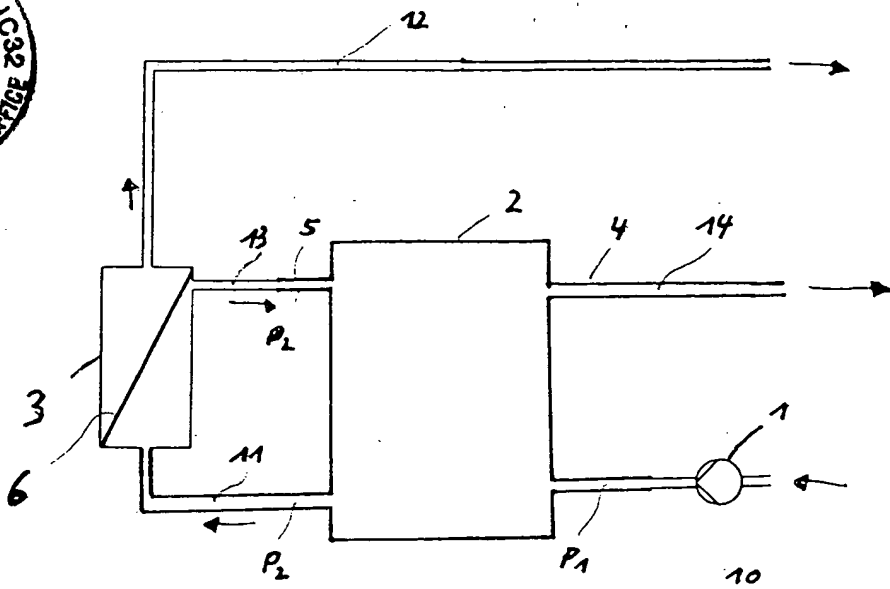
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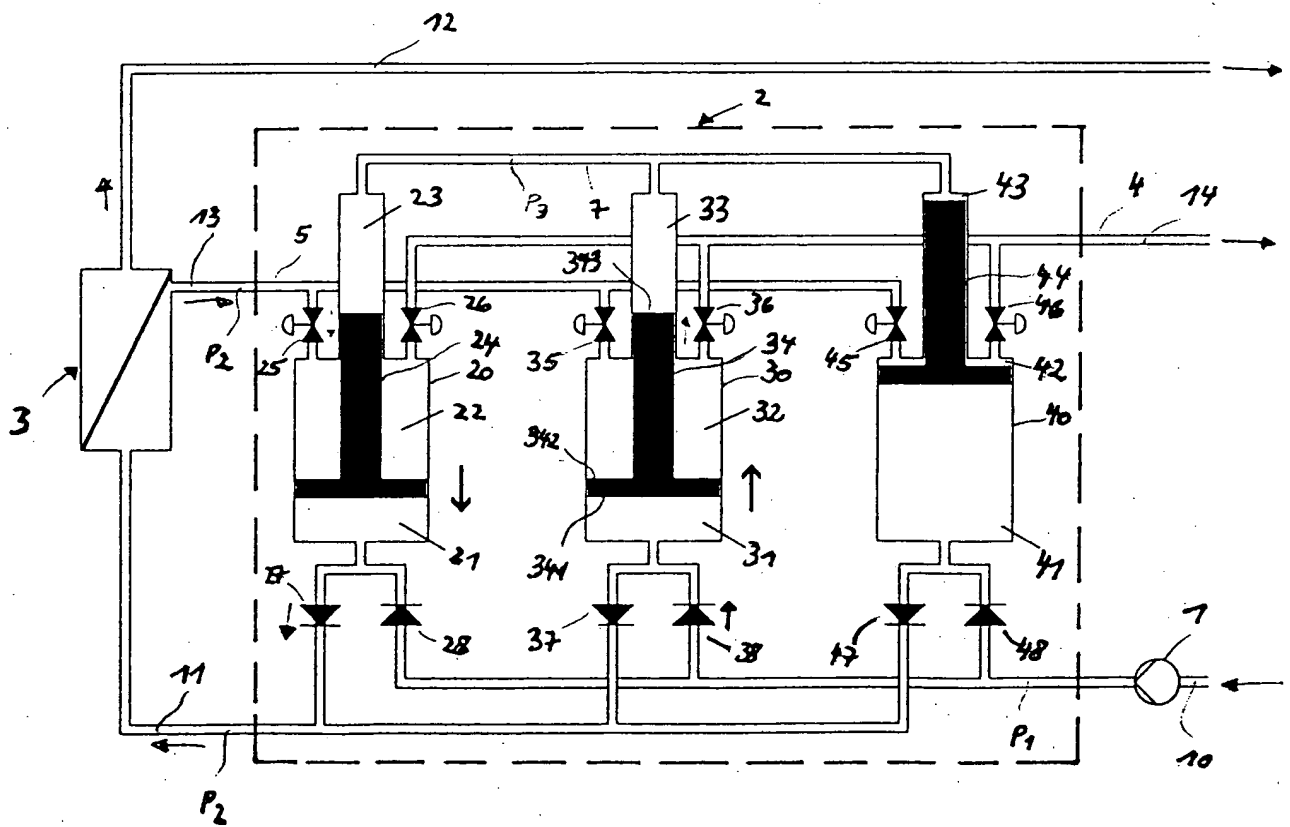
Copy of 4 Sheets of PCT Drawings (Figures 1-4)

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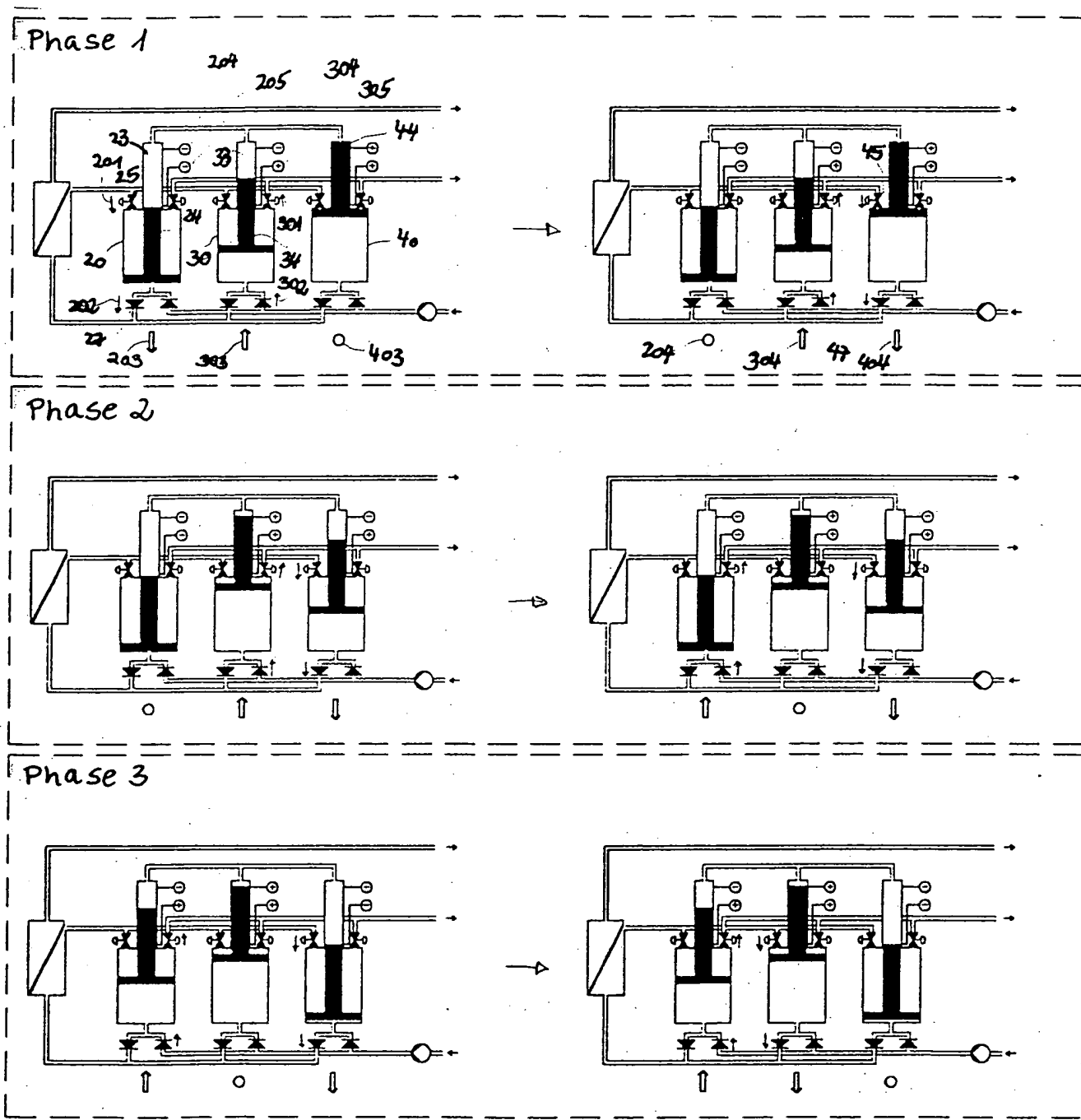
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Figur 1

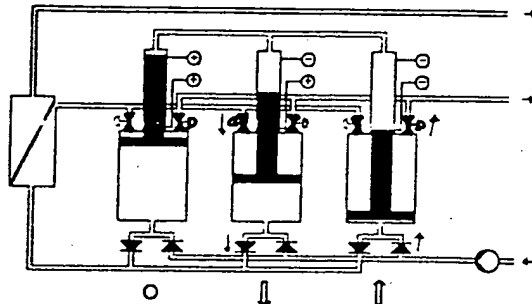
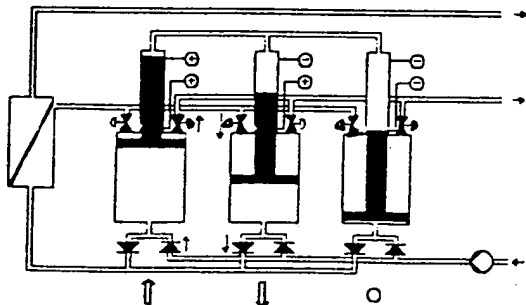


Figur 2

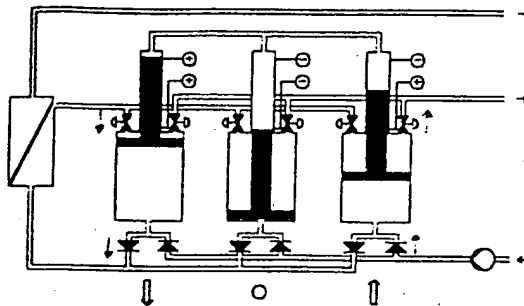
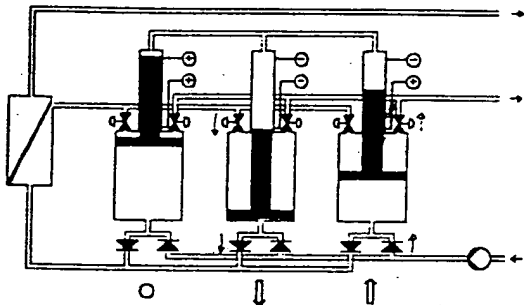


Figur 3a

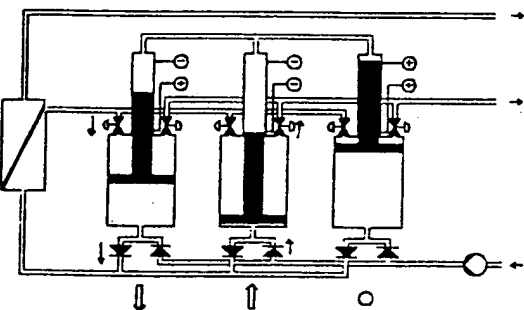
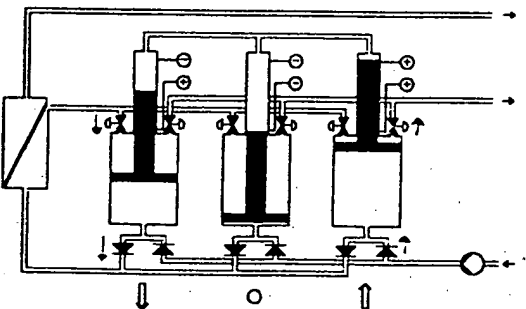
Phase 4




















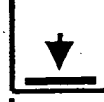

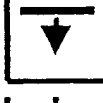










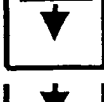



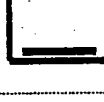
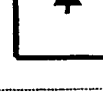
Phase 5









Phase 6



Figur 3b

1	 0,25	 0,25	 1
2	 0	 0,5	 1
3	 0	 0,75	 0,75
4	 0	 1	 0,5
5	 0,25	 1	 0,25
6	 0,5	 1	 0
7	 0,75	 0,75	 0
8	 1	 0,5	 0
9	 1	 0,25	 0,25
10	 1	 0	 0,5
11	 0,75	 0	 0,75
12	 0,5	 0	 1

1	 0,25	 0,25	 1
2	 0	 0,5	 1

Figur 4